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<110> Staskawicz, Brian J
Dahlbeck, Douglas
Tai, Thomas H

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<140> US 09/864,680

<141> 2001-05-24

<150> US 09/360,186

<151> 1999-07-23

<150> US 60/093,957

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234021.ST25.txt

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234021.ST25.txt

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Met Ala His Ala Ser Val Ala
1 5
tct ctt atg aga aca ata gaa tct ctc ttg aca ttc aat tcg ccg atg 161
Ser Leu Met Arg Thr Ile Glu Ser Leu Leu Thr Phe Asn Ser Pro Met
10 15 20
caa tct cta tcc tgt gat cac aga gaa gaa ctt tgc gct ctt cgt gaa 209
Gln Ser Leu Ser Cys Asp His Arg Glu Glu Leu Cys Ala Leu Arg Glu
25 30 35
aaa gtt agt tcc ctg gaa gta ttt gtc aag aac ttt gag aaa aac aat 257
Lys Val Ser Ser Leu Glu Val Phe Val Lys Asn Phe Glu Lys Asn Asn
40 45 50 55
gtt ttt ggg gaa atg acg gat ttt gaa gta gag gta aga gaa gtt gca 305
Val Phe Gly Glu Met Thr Asp Phe Glu Val Glu Val Arg Glu Val Ala
60 65 70
agt gct gct gaa tac aca att caa ctg aga cta aca gga act gta ctg 353
Ser Ala Ala Glu Tyr Thr Ile Gln Leu Arg Leu Thr Gly Thr Val Leu
75 80 85
gga gaa aat aaa agc cag aaa aaa aag gcg cgt cga agg ttt cgt caa 401
Gly Glu Asn Lys Ser Gln Lys Lys Lys Ala Arg Arg Arg Phe Arg Gln
90 95 100

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234021.ST25.txt

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aca aag atc caa gat aaa gga aaa caa gta tca aag gaa tca ttg gtt Thr Lys Ile Gln Asp Lys Gly Lys Gln Val Ser Lys Glu Ser Leu Val 120 125 130 135	497
cat gat ttt tca agt tca aca aac gat att ttg aag gtt aag aac aat His Asp Phe Ser Ser Ser Thr Asn Asp Ile Leu Lys Val Lys Asn Asn 140 145 150	545
atg gtt gga cgt gat gat caa agg aaa cag ttg tta gaa gat ctg act Met Val Gly Arg Asp Asp Gln Arg Lys Gln Leu Leu Glu Asp Leu Thr 155 160 165	593
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ggc ata ggt aaa aca acc tta gca aaa gaa gtt tac aat gat gaa tca Gly Ile Gly Lys Thr Thr Leu Ala Lys Glu Val Tyr Asn Asp Glu Ser 185 190 195	689
att cta tgc cgt ttt gat gtt cat gcc tgg gct acc ata tct caa cag Ile Leu Cys Arg Phe Asp Val His Ala Trp Ala Thr Ile Ser Gln Gln 200 205 210 215	737
cac aac aaa aag gaa att ttg ctg ggc ctt ctg cat tcc aca atc aaa His Asn Lys Lys Glu Ile Leu Leu Gly Leu Leu His Ser Thr Ile Lys 220 225 230	785
atg gat gac agg gtt aag atg att ggt gaa gca gag cta gca gac atg Met Asp Asp Arg Val Lys Met Ile Gly Glu Ala Glu Leu Ala Asp Met 235 240 245	833
tta cag aaa agt tta aag aga aag agg tac tta att gtc ttg gat gat Leu Gln Lys Ser Leu Lys Arg Lys Arg Tyr Leu Ile Val Leu Asp Asp 250 255 260	881
atc tgg agt tgt gaa gtg tgg gat ggc gtg aga cga tgc ttt cca act Ile Trp Ser Cys Glu Val Trp Asp Gly Val Arg Arg Cys Phe Pro Thr 265 270 275	929
gaa gac aat gca ggg agt cga ata ctg ttg act acc cgt aat gat gaa Glu Asp Asn Ala Gly Ser Arg Ile Leu Leu Thr Thr Arg Asn Asp Glu 280 285 290 295	977
gta gct tgt tat gct ggt gta gag aat ttt tct ttg cgg atg agc ttc Val Ala Cys Tyr Ala Gly Val Glu Asn Phe Ser Leu Arg Met Ser Phe 300 305 310	1025
atg gat caa gat gag agt tgg agt ctt ttc aaa agt gca gca ttt tca Met Asp Gln Asp Glu Ser Trp Ser Leu Phe Lys Ser Ala Ala Phe Ser 315 320 325	1073
agt gaa gca tta cca tat gag ttc gag act gtt gga aag caa atc gca Ser Glu Ala Leu Pro Tyr Glu Phe Glu Thr Val Gly Lys Gln Ile Ala 330 335 340	1121

234021.ST25.txt

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Asp Glu Cys His Gly Leu Pro Leu Thr Ile Val Val Val Ala Gly Leu	
345 350 355	
ctc aaa tct aaa agg aca ata gaa gat tgg aaa act gtt gct aaa gat	1217
Leu Lys Ser Lys Arg Thr Ile Glu Asp Trp Lys Thr Val Ala Lys Asp	
360 365 370 375	
gtc aag tca ttc gtc aca aat gat cct gat gaa cga tgt tca cgt gtg	1265
Val Lys Ser Phe Val Thr Asn Asp Pro Asp Glu Arg Cys Ser Arg Val	
380 385 390	
ctt ggg ttg agt tac gat cac ttg aca agc gat cta aaa aca tgt ctt	1313
Leu Gly Leu Ser Tyr Asp His Leu Thr Ser Asp Leu Lys Thr Cys Leu	
395 400 405	
ctg cat ttc gga att ttt cca gaa gac agt gat att cca gtg aag aat	1361
Leu His Phe Gly Ile Phe Pro Glu Asp Ser Asp Ile Pro Val Lys Asn	
410 415 420	
ttg atg aga tca tgg atg gct gag ggg ttc ctg aag ttg gaa aat gat	1409
Leu Met Arg Ser Trp Met Ala Glu Gly Phe Leu Lys Leu Glu Asn Asp	
425 430 435	
ttg gaa gga gag gtt gag aag tgt ttg caa gag ctt gtc gat aga tgt	1457
Leu Glu Gly Glu Val Glu Lys Cys Leu Gln Glu Leu Val Asp Arg Cys	
440 445 450 455	
cta gtc ctc gtc agc aag aga agt cga gat gga aca aaa att aga tca	1505
Leu Val Leu Val Ser Lys Arg Ser Arg Asp Gly Thr Lys Ile Arg Ser	
460 465 470	
tgt aag gtt cat gat cta ata tat gac ctg tgc gtg aga gaa gtt caa	1553
Cys Lys Val His Asp Leu Ile Tyr Asp Leu Cys Val Arg Glu Val Gln	
475 480 485	
agg gag aac att ttt atc atg aac gac att gtt ctt gac gta tca tat	1601
Arg Glu Asn Ile Phe Ile Met Asn Asp Ile Val Leu Asp Val Ser Tyr	
490 495 500	
cca gaa tgt tca tat ctc tgt atg tat aaa atg cag ccc ttt aag cgc	1649
Pro Glu Cys Ser Tyr Leu Cys Met Tyr Lys Met Gln Pro Phe Lys Arg	
505 510 515	
gtg act ggt gat gaa att aat tat tgt ccc tat ggt ctt tat agg gct	1697
Val Thr Gly Asp Glu Ile Asn Tyr Cys Pro Tyr Gly Leu Tyr Arg Ala	
520 525 530 535	
ctt ctt acc cct gta aat cgt cag ttg aga gat cat gac aac aac aat	1745
Leu Leu Thr Pro Val Asn Arg Gln Leu Arg Asp His Asp Asn Asn Asn	
540 545 550	
ctt ttg aaa cga acc cat tct gtt ttc tct ttt cat ctt gag cct tta	1793
Leu Leu Lys Arg Thr His Ser Val Phe Ser Phe His Leu Glu Pro Leu	
555 560 565	
tat tat gtt ctc aaa tca gag gtt gtt cat ttc aaa tta ctc aaa gtc	1841
Tyr Tyr Val Leu Lys Ser Glu Val Val His Phe Lys Leu Leu Lys Val	

570	575	580	
ttg gag ctg aga cac aga cag att gat ggt ttc cct cga gag ata cta Leu Glu Leu Arg His Arg Gln Ile Asp Gly Phe Pro Arg Glu Ile Leu 585 590 595			1889
agc ctc atc tgg ttg agg tac cta tca ttg ttc agc tat ggg aat ttc Ser Leu Ile Trp Leu Arg Tyr Leu Ser Leu Phe Ser Tyr Gly Asn Phe 600 605 610 615			1937
gat gta cct cca gaa att tgc agg tta tgg aat ctg cag aca ttc att Asp Val Pro Pro Glu Ile Cys Arg Leu Trp Asn Leu Gln Thr Phe Ile 620 625 630			1985
gtt caa cgg ttt cga tca gat ata ata att ttt gct gag gaa att tgg Val Gln Arg Phe Arg Ser Asp Ile Ile Ile Phe Ala Glu Glu Ile Trp 635 640 645			2033
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gat tgc cca agt gga tct gtt gac aaa gga agg cac ttg gat ttt tca Asp Cys Pro Ser Gly Ser Val Asp Lys Gly Arg His Leu Asp Phe Ser 665 670 675			2129
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234021.ST25.txt

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gcc aca aat gac aat ttt cct gtc ctt gag cgc ctc atg att aga agt      2609
Ala Thr Asn Asp Asn Phe Pro Val Leu Glu Arg Leu Met Ile Arg Ser
      825                      830                      835

tgc aaa aat ttg aaa gag ata ccc att gag ttt gca gat ata cac aca      2657
Cys Lys Asn Leu Lys Glu Ile Pro Ile Glu Phe Ala Asp Ile His Thr
      840                      845                      850

cta cag ctg att gag tta aga gag tgt cct ccc aaa ctt ggg gaa tct      2705
Leu Gln Leu Ile Glu Leu Arg Glu Cys Pro Pro Lys Leu Gly Glu Ser
      860                      865                      870

gct gca cga att cag aaa gaa caa gaa gac ctc gga aac aac cct gtg      2753
Ala Ala Arg Ile Gln Lys Glu Gln Glu Asp Leu Gly Asn Asn Pro Val
      875                      880                      885

gat gtt cgt atc tca aat cca ttg aag gag agt gat tct gat tca gaa      2801
Asp Val Arg Ile Ser Asn Pro Leu Lys Glu Ser Asp Ser Asp Ser Glu
      890                      895                      900

gaa cat tag gaaaggatct caaggccaga aggattgaac tcttgggatt      2850
Glu His
      905

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aaaaaaaaa      3099

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Glu Leu Cys Ala Leu Arg Glu Lys Val Ser Ser Leu Glu Val Phe Val
      35          40          45

Lys Asn Phe Glu Lys Asn Asn Val Phe Gly Glu Met Thr Asp Phe Glu
      50          55          60

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85 90 95

Ala Arg Arg Arg Phe Arg Gln Ser Leu Gln Gln Val Ala Glu Asp Met
100 105 110

Asp His Ile Trp Lys Glu Ser Thr Lys Ile Gln Asp Lys Gly Lys Gln
115 120 125

Val Ser Lys Glu Ser Leu Val His Asp Phe Ser Ser Ser Thr Asn Asp
130 135 140

Ile Leu Lys Val Lys Asn Asn Met Val Gly Arg Asp Asp Gln Arg Lys
145 150 155 160

Gln Leu Leu Glu Asp Leu Thr Arg Ser Tyr Ser Gly Glu Pro Lys Val
165 170 175

Ile Pro Ile Val Gly Met Gly Gly Ile Gly Lys Thr Thr Leu Ala Lys
180 185 190

Glu Val Tyr Asn Asp Glu Ser Ile Leu Cys Arg Phe Asp Val His Ala
195 200 205

Trp Ala Thr Ile Ser Gln Gln His Asn Lys Lys Glu Ile Leu Leu Gly
210 215 220

Leu Leu His Ser Thr Ile Lys Met Asp Asp Arg Val Lys Met Ile Gly
225 230 235 240

Glu Ala Glu Leu Ala Asp Met Leu Gln Lys Ser Leu Lys Arg Lys Arg
245 250 255

Tyr Leu Ile Val Leu Asp Asp Ile Trp Ser Cys Glu Val Trp Asp Gly
260 265 270

Val Arg Arg Cys Phe Pro Thr Glu Asp Asn Ala Gly Ser Arg Ile Leu
275 280 285

Leu Thr Thr Arg Asn Asp Glu Val Ala Cys Tyr Ala Gly Val Glu Asn

290

295

300

Phe Ser Leu Arg Met Ser Phe Met Asp Gln Asp Glu Ser Trp Ser Leu
 305 310 315 320

Phe Lys Ser Ala Ala Phe Ser Ser Glu Ala Leu Pro Tyr Glu Phe Glu
 325 330 335

Thr Val Gly Lys Gln Ile Ala Asp Glu Cys His Gly Leu Pro Leu Thr
 340 345 350

Ile Val Val Val Ala Gly Leu Leu Lys Ser Lys Arg Thr Ile Glu Asp
 355 360 365

Trp Lys Thr Val Ala Lys Asp Val Lys Ser Phe Val Thr Asn Asp Pro
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Asp Glu Arg Cys Ser Arg Val Leu Gly Leu Ser Tyr Asp His Leu Thr
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Ser Asp Ile Pro Val Lys Asn Leu Met Arg Ser Trp Met Ala Glu Gly
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Gln Glu Leu Val Asp Arg Cys Leu Val Leu Val Ser Lys Arg Ser Arg
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Asp Gly Thr Lys Ile Arg Ser Cys Lys Val His Asp Leu Ile Tyr Asp
 465 470 475 480

Leu Cys Val Arg Glu Val Gln Arg Glu Asn Ile Phe Ile Met Asn Asp
 485 490 495

Ile Val Leu Asp Val Ser Tyr Pro Glu Cys Ser Tyr Leu Cys Met Tyr
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Lys Met Gln Pro Phe Lys Arg Val Thr Gly Asp Glu Ile Asn Tyr Cys
 515 520 525

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Pro Tyr Gly Leu Tyr Arg Ala Leu Leu Thr Pro Val Asn Arg Gln Leu
 530 535 540

Arg Asp His Asp Asn Asn Asn Leu Leu Lys Arg Thr His Ser Val Phe
 545 550 555 560

Ser Phe His Leu Glu Pro Leu Tyr Tyr Val Leu Lys Ser Glu Val Val
 565 570 575

His Phe Lys Leu Leu Lys Val Leu Glu Leu Arg His Arg Gln Ile Asp
 580 585 590

Gly Phe Pro Arg Glu Ile Leu Ser Leu Ile Trp Leu Arg Tyr Leu Ser
 595 600 605

Leu Phe Ser Tyr Gly Asn Phe Asp Val Pro Pro Glu Ile Cys Arg Leu
 610 615 620

Trp Asn Leu Gln Thr Phe Ile Val Gln Arg Phe Arg Ser Asp Ile Ile
 625 630 635 640

Ile Phe Ala Glu Glu Ile Trp Glu Leu Met Gln Leu Arg His Leu Lys
 645 650 655

Leu Pro Arg Phe Tyr Leu Pro Asp Cys Pro Ser Gly Ser Val Asp Lys
 660 665 670

Gly Arg His Leu Asp Phe Ser Asn Leu Gln Thr Ile Ser Tyr Leu Ser
 675 680 685

Pro Arg Cys Cys Thr Lys Glu Val Ile Met Gly Ile Gln Asn Val Lys
 690 695 700

Lys Leu Gly Ile Ser Gly Asn Lys Asp Asp Tyr Lys Ser Phe Arg Asp
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Ser Gly Leu Pro Asn Asn Leu Val Tyr Leu Gln Gln Leu Glu Ile Leu
 725 730 735

Ser Leu Ile Ser Val Asp Tyr Ser Leu Leu Pro Val Ile Ile Ser Ser
 740 745 750

Ala Lys Ala Phe Pro Ala Thr Leu Lys Lys Leu Lys Leu Glu Arg Thr
 755 760 765

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Tyr Leu Ser Trp Ser Tyr Leu Asp Ile Ile Ala Glu Leu Pro Asn Leu
 770 775 780

Glu Val Leu Lys Leu Met Asp Asp Ala Cys Cys Gly Glu Glu Trp His
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Pro Ile Val Met Gly Phe Asn Arg Leu Lys Leu Leu Leu Ile Lys Tyr
 805 810 815

Ser Phe Leu Lys Phe Trp Lys Ala Thr Asn Asp Asn Phe Pro Val Leu
 820 825 830

Glu Arg Leu Met Ile Arg Ser Cys Lys Asn Leu Lys Glu Ile Pro Ile
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Glu Phe Ala Asp Ile His Thr Leu Gln Leu Ile Glu Leu Arg Glu Cys
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Pro Pro Lys Leu Gly Glu Ser Ala Ala Arg Ile Gln Lys Glu Gln Glu
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 aagatccaag ataaaggaaa acaagtatca aaggaatcat tggttcatga tttttcaagt 420
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<220>
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<220>
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<220>

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<210> 9

<211> 2053

<212> DNA

<213> Capsicum annuum

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22